

# Daily Report

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## Research

This afternoon I talked with Prof.Chen about visual representation of an SVM result, including data instances, support vectors and decision boundaries. We decided to use an enhanced barycentric coordinate system with 3D effects. The current method for barycentric coordinates transformation is from RadViz:

$$\sum_{i=0}^{dim-1} w_i = 1$$
$$\mathbf{d} = \sum_{i=0}^{dim-1} w_i \mathbf{q}_i$$

where  $dim$  is the dimension of data instances,  $w_i$  the weight of dimension  $i$  and  $\mathbf{q}_i$  the coordinates of corresponding vertex.

Figure 1 is the current result, while Figure 2 is the result of RadViz in Python Pandas (the data storing engine I am using in this project now). It is obvious that the result is almost the same, which indicates that the algorithm is just right.

## Attic

I discussed with Xinxin about the SceneTree structure and the relation between SceneTree and layouts. The previous idea was that the layout should be a part of nodes in the SceneTree, however there are many issues that can not fit in this structure. After discussion, we decided to separate the layouts from SceneTree in order to create a free-style binding between visual objects and the layouts. In other words, we change the structure of layouts into a simple list, in which each item represents an layout related to single or multiple visual objects regardless of the hierarchy of each visual object in the SceneTree.

## Plans for Tomorrow

Research:

- Implement the 3D effect: I decide to use `Three.js` as WebGL rendering library for the 3D barycentric coordinate system on web browser;
- Begin to implement the clustering algorithm of support vectors.

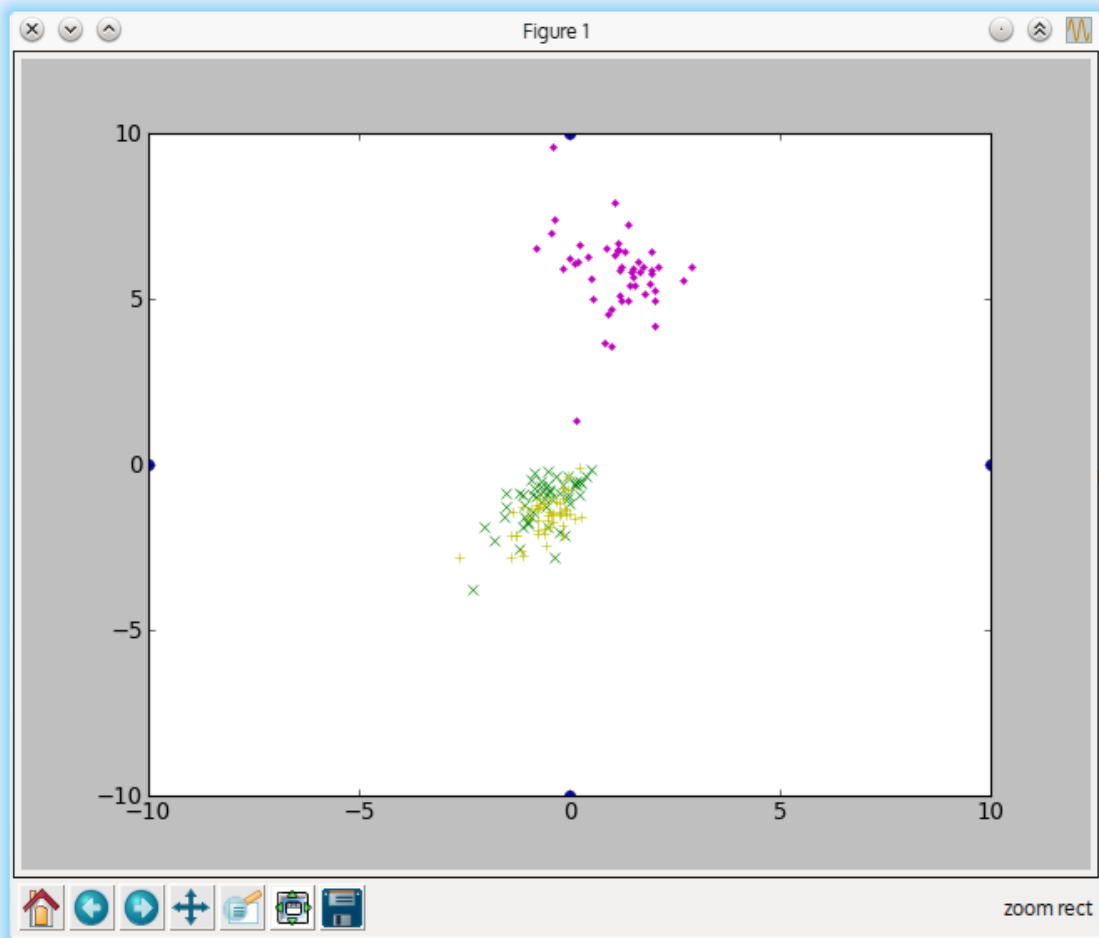


Figure 1: Result after transformation. The four vertices of the polygon (square here) is shown as black circles on the center of each edges. It is

Miscellaneous:

- Review the final version and fill related forms of the JCST paper.

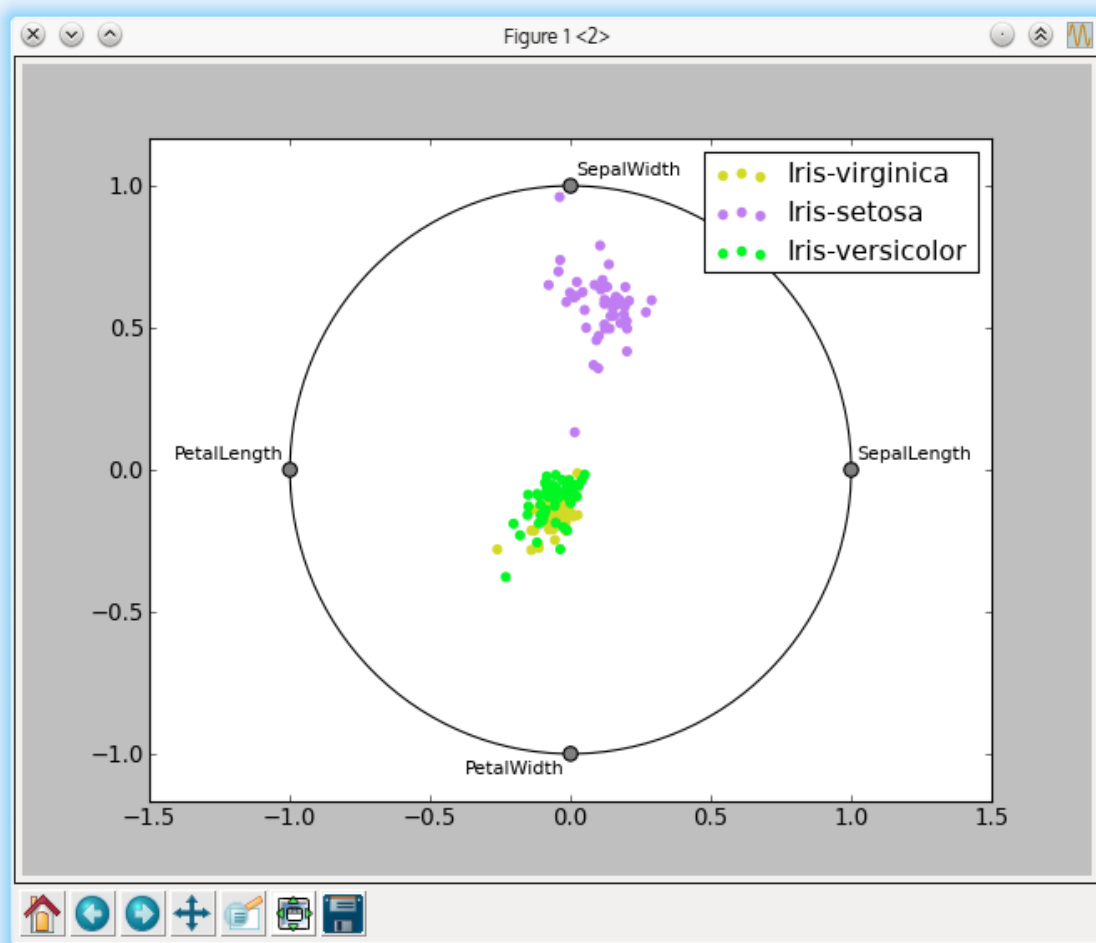


Figure 2: t